SOV/110-59-8-20/24

AUTHOR: Yevseyev, A.A., Engineer.

TITLE: A Conference on Transformer Construction.

PERIODICAL: Vestnik elektropromyshlennosti 1959, Nr 8, pp 73-74 (USSR)

ABSTRACT: A session of the Temporary Commission on Transformer Construction was held under the Chairmanship of Engineer S.I. Rabinovich to consider the main characteristics of a series of small and medium-output transformers with aluminium windings. The session was attended by representatives of research and design institutes, GOSPLAN USSR, GOSSTROY USSR, the Committee of Standards and Measuring Instruments, the Ministries of Power Stations, Agriculture and Communal Economy of the RSFSR and also transformer manufacturers and users from Moscow, Leningrad, Sverdlovsk, Zaporozh'ye, Yerevan and other towns. The report of Engineer L.M. Shnitser noted the tendency to use aluminium instead of copper for small and medium transformers but not for large because of the high resistivity and low mechanical

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strength of aluminium. The amounts of material required for transformers of different sizes with copper and aluminium windings were compared and the use of aluminium was recommended for small transformers. Engineer M.G. Gukasyan described the development of a series of transformers of the first frame size using aluminium windings. The dimensions were 20% greater than for the corresponding transformer with copper winding; the total weight was 5% greater and the cost about 20% higher. Cold-rolled steel must be used for the cores. Engineer I.S. Kalinichenko described the design of a 1000 kVA 10 kV transformer with aluminium windings using a core of hot-rolled steel. Several types of transformer were designed and some of them were made; the leading characteristics are tabulated. The author considers it possible to construct transformers with aluminium windings, but the manufacturing costs for the materials and labour will be more expensive and the total costs from 5 to 10% greater than for transformers with copper windings. The scale of ratings should, however, be revised. Engineer K.K. Balashov noted the possibility of

reducing transformer losses by the use of aluminium windings. It was shown that losses could be reduced to some 25 to 30% of those for the existing standard GOST401-41 without much influencing the total weight of active materials in the transformer. Eddy-current losses are not very great in aluminium windings because of the higher resistivity of the material. Engineers P.M. Tikhomirov, P.G. Grudinskiy, V.S. Bogoyavlenskiy, M.V. Khomyakov and S.I. Rabinovich participated in the discussion and recommended the use of aluminium windings for small and medium transformers. The economy of copper that would result from converting power transformers of outputs up to 180 kVA to aluminium windings would be about 3600 tons per year: if all small and medium transformers were made with aluminium windings the economy of copper should be at least 25000 tons during the Seven Year Plan. A further 20% economy of copper would accrue if power transformers of up to 5600 kVA were to be designed with aluminium windings. Cold-rolled steel should be used in transformers with aluminium windings. There is 1 table.

FANIYEV, G.G., inzh.; POMOGALOV, M.I., inzh.; GULI-ZADE, S.B.; YEVSEYEV, A.G.; ZAREMBO, G.V., inzh.

Automatic gravimtric proportioning of formula components for margarine at the Baku Margarine Plant. Masl.-zhir. prom. 23 no.12: 35-38 '57. (MIRA 11:2)

1. Giprozhir (for Faniyev). 2. Bakinskiy margarinovyy zavod (for Pomogalov, Guli-Zade, Yevseyev). 3. Vsesoyuznyy nauchno-issledovatel'skiy institut zhirov (for Zarembo).
(Baku--Margarine) (Weighting machines)

MARTYNOV, F.A., mashinist teplovoza; SOKOLOV, B.I., mashinist teplovoza; YEVSEYEV, A.G., mashinist teplovoza; VASILENKO, V.I., mashinist teplovoza; LAUKHIN, T.A., mashinist teplovoza

We shall raise the monthly productivity for diesel locomotives to 40 million tkm. Elek. i tepl. tiaga 2 no.11:5 N '58.
(MIRA 11:12)

1. Depo Liski Yugo-Vostochnoy dorogi.
(Liski--Diesel Locomotives)

DEMCHENKO, Anatoliy Tarasovich; YEVSEYEV, Anatoliy Ivanovich; DATSENKO, Petr Fedorovich

[Mechanical equipment of continuous small-section and wire-rod rolling mills] Mekhanicheskoe oborudovanie nepreryvnykh melkosortnykh i provolochnykh stanov. Moskva, Metallurgiia, 1965. 156 p. (MIRA 18:7)

YEVSEYEV, A.I.

Pay unremitting attention to safety measures. Transp. i khran. nefti. i nefteprod. no.3:18-21 '65.

(MIRA 18:9)

1. Glavnoye upravleniye po transportu i snabzheniyu nafi'yu i nefteproduktami pri Sovete Ministrov RSFSR.

DEMCHENKO, A.T.; YEVSEYEV, A.I.

Molybdenum disulfide lubricant. Metallurg 9 no.1:37 Ja '64
(MIRA 18:1)

1. Vsesoyuznoye ob"yedineniye "Stankoimport" i sortoprokatnyy tsekh No.2 Krivorozhskogo metallurgicheskogo zavoda.

.11(7),5(2)

AUTHORS: Dubrovin, I. N., Yevseyev, A. K. SOV/89-7-4-14/28

TITLE: The Thermodynamics of the Reduction of Uranium Tetrafluoride by Magnesium

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 4, pp 379-382 (USSR)

ABSTRACT: A system consisting of condensed phases (uranium, magnesium fluoride, uranium tetrafluoride) and magnesium vapor may be considered to be monovariant at the temperature of thermal magnesium reduction ($\sim$1400°C) if a certain reciprocal solubility of its components is neglected. In this case the constants of reaction equilibrium at various temperatures may be determined from the equation of the isothermal line of the reaction: $\Delta F^{o} = -4.576\ T\ \lg K$ or $\Delta F^{o} = -4.576\ T\ \lg(1/P^{2}_{Mg})$. Here, P_{Mg} denotes the equilibrium pressure of the magnesium vapors. The variations ΔF^{o}_{T} of the free energy of the reaction were determined for various temperature intervals from the Gibbs-Helmholtz-equation. When determining the variation of free energy the following phase transformations were taken into

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account: (1) The melting of magnesium at the temperature of 923°K. (2) The transition of α-uranium into β-uranium at 938°K. (3) The transition of β-uranium into γ-uranium at 1,045°K. (4) The melting of UF_4 at 1,309°K (5) The boiling of the magnesium at 1,376°K. (6) The melting of the uranium at 1,406°K. (7) The melting of MgF_2 at 1,536°K. The results of the computations are compiled in a table in form of equations for the variation of the free energy of the reaction. The smoothed values of this variation ΔF^o are shown by a diagram. The third table shows the numerical values of ΔF^o, lg K, and P_{Mg} for the characteristic temperatures, and, for comparison, the results of other calculations of ΔF^o. According to these results, the reduction of UF_4 by magnesium at 1,400°C develops practically completely in the direction of the side at which metallic uranium and MgF_2 are produced, because the equilibrium pressure of the magnesium vapors is very low at this temperature (0.8 torr). The higher the magnesium vapor pressure in the closed reaction

apparatus (in the closed vessel), the more rapid and complete will be the reduction. In the case of an excess (0.5% to 10%) of magnesium in the melting stock its vapor pressure in the bomb amounts to 8 atmospheres at 1,400°C. If black uranium is remelted (refined)($\sim$1,400°C) in vacuum (which is higher than the magnesium vapor pressure corresponding to equilibrium for the reduction) a reaction develops in the inverse direction between the black uranium and the slag inclusions of MgF_2. In this case separation of uranium from MgF_2 is brought about more completely by the volatilization of the produced magnesium and of UF_4. There are 1 figure, 3 tables, and 11 references, 4 of which are Soviet.

SUBMITTED: April 9, 1959

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85568

S/089/60/009/005/013/020
B025/B070

24.3100

AUTHORS: Dubrovin, I. M., Yevseyev, A. K.

TITLE: Thermodynamics of the Reduction of the Fluorides of Potassium and Sodium by Metallic Calcium and Magnesium

PERIODICAL: Atomnaya energiya, 1960, Vol. 9, No. 5, pp. 414 - 417

TEXT: Impurities of potassium and sodium occur in uranium tetrafluoride mostly in the form of fluorides. They disturb the reaction of uranium and decrease its yield. It is with a view to study these disturbing effects that the change of the thermodynamic potential ΔF_T° in the reactions quoted in Table 2 has been calculated for different intervals of temperature, starting data being taken from Table 1. The calculated temperature dependence of the free energy of potassium and sodium fluorides on reaction with calcium and magnesium is represented in the attached diagram. The conclusion is that in the fusion reduction of uranium tetrafluoride the admixtures of alkali metals must be as low as possible. There are 1 figure, 2 tables, and 9 references:

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85568

Thermodynamics of the Reduction of the Fluorides of Potassium and Sodium by Metallic Calcium and Magnesium

S/089/60/009/005/013/020
B025/B070

5 Soviet, 1 US, and 3 British.

SUBMITTED: February 29, 1960

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S/089/60/009/005/013/020
B025/B070

Table 1

Термодинамическая величина и ее размерность 1)	Компонент реакции 2)	Значение термодинамической величины 3)	Литература 4)	Теплоемкость C_p, кал/моль·град 5)	Температурный интервал C_p, °K 6)	Литература для C_p 7)
ΔF^0_{298}, ккал/моль	NaF	−129,3	[2]	—	—	—
ΔF^0_{2811} » »	KF	−127,4	[3]	—	—	—
ΔF^0_{298} » »	CaF_2	−277,7	[2]	—	—	—
ΔH^0_{298}, ккал/моль	NaF	−136,0	[2]	—	—	—
ΔH^0_{298} » »	KF	−134,5	[3]	—	—	—
ΔH^0_{298} » »	CaF_2	−290,3	[2]	—	—	—
ΔS^0_{298}, кал/моль·град	NaF	14,0	[3]	—	—	—
ΔS^0_{298} » » »	KF	15,91	[3]	$10,79+4,2\cdot10^{-3}T$	273—1285	[4]
				$11,27+3,86\cdot10^{-3}T-0,69\cdot10^{5}\cdot T^{-2}$	330—550	[4]
ΔS^0_{298} » » »	CaF_2	16,46	[3]			
ΔS^0_{298} » » »	Na	12,2	[3]	$13,8+7,8\cdot10^{-3}T$	298—1424	[4]
ΔS^0_{298} » » »	K	15,2	[3]	$5,01+5,36\cdot10^{-3}T$	298—371	[4]
ΔS^0_{298} » » »	Ca	9,95	[3]	$5,24+5,55\cdot10^{-3}T$	273—336,5	[4]
$\Delta H_{пр}$, ккал/моль	α Ca → β Ca	0,24	[4]	$5,31+3,33\cdot10^{-3}T$	273—713	[4]
$\Delta H_{пр}$ » »	α CaF_2 → β CaF_2	1,14	[3]	$1,5+7,74\cdot10^{-3}T+2,5\cdot10^{5}\cdot T^{-2}$	750—1123	[4]
				$25,81+2,5\cdot10^{-3}T$	1424—1691	[4]
$\Delta H_{пл}$, ккал/моль	NaF	7,8	[4]			
$\Delta H_{пл}$ » »	KF	6,3	[4]	16,0	>1256	[5]
$\Delta H_{пл}$ » »	CaF_2	7,1	[3]	10,7	>1159	[5]
$\Delta H_{пл}$ » »	Na	0,63	[4]	23,88	1691—1800	[4]
$\Delta H_{пл}$ » »	K	0,57	[4]	7,5	371—450	[4]
$\Delta H_{пл}$ » »	Ca	2,2	[3]	7,7	336,5—373	[4]
$\Delta H_{исп}$, ккал/моль	Na	23,4	[4]	7,4	1123—1223	[4]
$\Delta H_{исп}$ » »	K	19,0	[4]	4,97	>1156	[3]
$\Delta H_{исп}$ » »	Ca	34,8	[6]	4,97	>1048	[3]
				4,97	1713	[3]

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B025/B070

Legend to Table 1:

1) Thermodynamical quantity and its dimension
2) Components of reaction
3) Value of the thermodynamical quantity
4) References
5) Specific heat C_p (cal/mole.deg)
6) Temperature interval for C_p
7) References for C_p

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B025/B070

1) Интервал температур, °K	ΔF°_T, кал/моль
	$2NaF + Ca = 2Na + CaF_2$
298—371	$-17\,690 - 21,4T - 3,4\cdot10^{-3}T^2 + 7,06T\ \lg T$
371—713	$-17\,540 + 5,64T + 1,07\cdot10^{-3}T^2 - 4,39T\ \lg T$
713—1123	$-19\,730 + 31,9T + 4,17\cdot10^{-3}T^2 + 1,25\cdot10^5T^{-1} - 13,14T\ \lg T$
1123—1156	$-19\,820 - 5,07T + 0,3\cdot10^{-3}T^2 + 0,43T\ \lg T$
1156—1265	$32\,840 - 86,29T + 0,3\cdot10^{-3}T^2 + 12,08T\ \lg T$
1265—1424	$23\,700 - 148,1T - 3,9\cdot10^{-3}T^2 + 36,05T\ \lg T$
1424—1691	$15\,100 - 57,48T - 1,25\cdot10^{-3}T^2 + 8,42T\ \lg T$
1691—1713	$27\,010 - 82,13T + 12,86T\ \lg T$
1713—1977	$-11\,960 - 41,3T + 7,26T\ \lg T$
	$2KF + Ca = 2K + CaF_2$
298—336,5	$-20\,200 - 27,39T - 3,93\cdot10^{-3}T^2 - 0,69\cdot10^5T^{-1} + 8,2T\ \lg T$
336,5—713	$-20\,000 - 1,17T + 1,03\cdot10^{-3}T^2 - 0,69\cdot10^5\cdot T^{-1} - 3,1T\ \lg T$
713—1048	$-22\,280 + 25,16T + 3,83\cdot10^{-3}T^2 + 0,56\cdot10^5\cdot T^{-1} - 11,85T\ \lg T$
1048—1123	$21\,440 - 54,3T + 3,83\cdot10^{-3}T^2 + 0,56\cdot10^5\cdot T^{-1} + 0,75T\ \lg T$
1123—1159	$21\,350 - 61,27T - 0,04\cdot10^{-3}T^2 - 0,69\cdot10^5\cdot T^{-1} + 14,32T\ \lg T$

Table 2

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1159—1424	$16\,060 - 158,63T - 3,9\cdot10^{-3}T^2 + 39,32T\,\lg T$
1424—1691	$5400 - 68,02T - 1,25\cdot10^{-3}T^2 + 11,7T\,\lg T$
1691—1713	$19\,370 - 92,67T + 16,14T\,\lg T$
1713—1775	$-19\,600 - 51,84T + 10,54T\,\lg T$

$2NaF + Mg = 2Na + MgF_2$

298—371	$7530 - 0,18T - 1,29\cdot10^{-3}T^2 + 1,28\cdot10^{-5}T^{-1} + 0,02T\,\lg T$
371—923	$7680 + 26,86T + 4,03\cdot10^{-3}T^2 + 1,28\cdot10^{5}\cdot T^{-1} - 11,43T\,\lg T$
923—1156	$7180 + 9,61T + 2,85\cdot10^{-3}T^2 + 1,33\cdot10^{5}\cdot T^{-1} - 5,06T\,\lg T$
1156—1265	$59\,830 - 71,61T + 2,85\cdot10^{-3}T^2 + 1,33\cdot10^{5}T^{-1} + 6,6T\,\lg T$
1265—1370	$50\,690 - 133,41T - 1,35\cdot10^{-3}T^2 + 1,33\cdot10^{5}\cdot T^{-1} + 30,58T\,\lg T$
1376—1536	$14\,520 - 85,12T - 1,35\cdot10^{-3}T^2 + 1,33\cdot10^{5}\cdot T^{-1} + 23,56T\,\lg T$
1536—1977	$23\,040 - 50,98T + 10,47T\,\lg T$

Table 2

$2KF + Mg = 2K + MgF_2$

298—336,5	$5020 - 6,17T - 1,82\cdot10^{-3}T^2 + 0,59\cdot10^{5}\cdot T^{-1} + 1,17T\,\lg T$
336,5—923	$5120 + 20,12T + 3,74\cdot10^{-3}T^2 + 0,59\cdot10^{5}\cdot T^{-1} - 10,13T\,\lg T$
923—1048	$4030 + 2,87T + 2,51\cdot10^{-3}T^2 + 0,64\cdot10^{5}\cdot T^{-1} - 3,76T\,\lg T$
1048—1159	$48\,350 - 70,59T + 2,51\cdot10^{-3}T^2 + 0,64\cdot10^{5}\cdot T^{-1} + 8,85T\,\lg T$
1159—1376	$43\,060 - 143,95T - 1,35\cdot10^{-3}T^2 + 1,33\cdot10^{5}\cdot T^{-1} + 33,85T\,\lg T$
1376—1536	$6880 - 95,66T - 1,35\cdot10^{-3}T^2 + 1,33\cdot10^{5}\cdot T^{-1} + 26,85T\,\lg T$
1536—1775	$15\,400 - 61,52T + 13,76T\,\lg T$

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Legend to Table 2: 1) Temperature interval

YEVSEYEV, A. M.

RYABTSEV, L.N.; KARPETA, D.I.; MOREV, I.I.; RAYEV, Yu.O.; KLOKOV, P.V.; ZHEMBUS, M.D.; YEVSEYEV, A.M.; TKACHENKO, V.K.

Young blast furnace operators are exchanging work practices. Metallurg no.12:7-10 D '56. (MIRA 10:1)

1. Master domennoy pechi no.7 Magnitogorskogo metallurgicheskogo kombinata (for Ryabtsev). 2. Master domennoy pechi no.7 Magnitogorskogo metallurgicheskogo kombinata (for Karpeta). 3. Master Magnitogorskogo metallurgicheskogo kombinata (for Morev). 4. Pomoshchnik mastera Kuznetskogo metallurgicheskogo kombinata (for Rayev). 5. Master metallurgicheskogo zavoda imeni Serova (for Klokov). 6. Master metallurgicheskogo zavoda imeni Petrovskogo (for Zhembus). 7. Master Chusovskogo metallurgicheskogo zavoda (for Yevseyev). 8. Master Makeyevskogo metallurgicheskogo zavoda (for Tkachenko).

(Magnitogorsk--Blast furnaces)

L 12773-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JW/JD

ACCESSION NR: AP3002945 S/0076/63/037/006/1411/1412

57

AUTHOR: Yevseyeva, G. V.; Yevseyev, A. M.

TITLE: Thermodynamic properties of alloys of the manganese-copper system

SOURCE: Zhurnal fizicheskoy khimii, v. 37, no. 6, 1963, 1411-1412

TOPIC TAGS: alloy thermodynamic property, manganese-copper system, alloy property

ABSTRACT: The thermodynamic properties of alloys of the manganese-copper system were studied in the temperature interval 1163-1211K by measuring the pressure of saturated vapor. The volatile component was manganese. The instrument and methodology of measurement used were identical with that described by Voronin and Yevseyev (Zhurn. fiz. khimii, 33, 1959, 2245). Phase diagrams were constructed

Yevseyev (Zhurn. fiz. khimii, 33, 1959, 2245). Phase diagrams were constructed for various temperatures. Orig. art. has: 2 tables and 2 formulas.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 25Nov62 DATE ACQ: 16Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 001 OTHER: 001

Card 1/1

L 12773-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JW/JD

ACCESSION NR: AP3002945 S/0076/63/037/006/1411/1412

AUTHOR: Yevseyeva, G. V.; Yevseyev, A. M. 57

TITLE: Thermodynamic properties of alloys of the manganese-copper system

SOURCE: Zhurnal fizicheskoy khimii, v. 37, no. 6, 1963, 1411-1412

TOPIC TAGS: alloy thermodynamic property, manganese-copper system, alloy property

ABSTRACT: The thermodynamic properties of alloys of the manganese-copper system were studied in the temperature interval 1162-1211K by measuring the pressure of saturated vapor. The volatile component was manganese. The instrument and methodology of measurement used were identical with that described by Voronin and

for various temperatures. Orig. art. has: 2 tables and 2 formulas.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 25Nov62 DATE ACQ: 16Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 001 OTHER: 001

Card 1/1

YEVSEYEVA, G.V.; YEVSEYEV, A.M.

Thermodynamic properties of alloys of the system manganese-copper. Zhur. fiz. khim. 37 no.6:1411-1412 Je '63. (MIRA 16:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Manganese-copper alloys--Thermodynamic properties)

Yevseyev, A.M.

USSR

Association of polar molecules in solutions. A. M. Evseev and V. P. Leontiev (M. V. Lomonosov State Univ., Moscow). *Zhur. Fiz. Khim.* 27, 1068–78(1953); cf. Panchenkov *Theory of the Viscosity of Liquids*, 1947, 158 pp. (*C.A.* 41, 928d).—No specific model can be used in calcn. of the degree of assocn. of polar mols. in soln. by means of the equation $\eta = (P_\infty - P)/(P_\infty - R)$, where η is the ratio of the no. of solute mols. in the assocd. state to the total no. of solute mols., P_∞ and P are the effective molar polarization at infinite dilu. and the actual concn., resp., and R is the molar refraction; the resulting value of η is only the min. no. of assocd. mols. The molar orientation polarization P_{or} can be calcd. for the electrostatic case by means of the equation $P'_{or} = P_{or} e^{-kT}$, where P_{or} is the P_{or} at infinite dilu., k is 1.5 ($P_{or} = d/M$, and γ, d, and M are the mole fraction, d., and mol. wt. of the solute, resp. This equation is valid at temps. as low as −50°. The mol. interaction const. is also expressed as $\beta = N_0 k^2/kTM$, where N_0, k, and T are

TEVSEYEV, A.M.; OBTEMPERANSKAYA, S.I.

In the Department of Chemistry. Vest.Mosk.un. 9 no.6:147-149 Je '54. (MLRA 7:8)
(Chemistry)

YEVSEYEV, A.M. and LEBEDEV, V. P. Sr/Sci. Colleague

"Concerning the Theory of Association in Polar Liquids", a paper given at the All-University Scientific Conference "Lomonosov Lectures", Vest. Mosk. Un., No 8,

Translation U-7895 1 Mar 56

YEVSEYEV, A.M.

76-11-5/35

AUTHOR: Yevseyev, A.M.

TITLE: On the Problem of the Theory of Liquids (K voprosu o teorii zhidkosti)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 11, pp. 2414-2422 (USSR)

ABSTRACT: A consistent derivation of the statistical sum of states for a system with particles which are in interaction is given. The results thus obtained are applied to the theory of liquid metal systems. It is shown that it is practically possible to compute the thermodynamic functions of the solution if only the constants contained in the expression for the potential of the interaction between two molecules are available. The method suggested here differs from the well-known cell method by its logical derivation and by the possibility of being widely used in the theory of solutions. There are 3 figures, 3 tables, and 14 references, 5 of which are Slavic.

ASSOCIATION: Moscow State University imeni M.V. Lomonosov (Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova)

SUBMITTED: April 6, 1957

AVAILABLE: Library of Congress

Card 1/1

GERASIMOV, Ya.I.; YEVSHYEV, A.M.; POZHARSKAYA, G.V.

Determining thermodynamic parameters of chromium-cobalt alloys by measurements of saturated chromium vapor. Issl. po zharopr. splav. 3:56-60 '58. (MIRA 11:11)
(Chromium-cobalt alloys--Thermal properties)
(Vapor pressure--Measurement)

SOV/70-4-3-10/32

AUTHORS: Alekseyev, N.V. and Yevseyev, A.M.

TITLE: Investigation of the Structures of Liquid Alloys of Cd and Sn

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 3, pp 348-352 (USSR)

ABSTRACT: Alloys of Cd and Sn with 15 to 65% Cd were examined electronographically (EM-4) by the method described earlier (the author and Ya.I. Gerasimov - Ref 2) with a hot stage working at up to 300 °C. Layers $\leq 3 \times 10^{-6}$ cm thick of the alloys were prepared on films of polystyrene on glass and were then floated off. Ether and ethyl bromide in equal quantities were found most suitable for this. For each specimen standard multiple exposures were made of NH_4Cl for calibrating the blackening.

The intensity curves were transformed to radial distributions by the Kuttner-Warren formula. With difficulty, the co-ordination numbers were calculated. Except for the eutectic, no tendency to peak-splitting was observed and results could be calculated either assuming micro-heterogeneity (A atoms preferentially surrounded by B and

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Investigation of the Structures of Liquid Alloys of Cd and Sn

vice versa) or complete randomness. The latter was favoured except for the quasi-eutectic (2/1) giving results for the co-ordination numbers:

Sn	pure	$n_{Sn} = 10.0$	-
Sn/Cd	85/15	$n_{Sn} = 8.3$	$n_{Cd} = 1.5$
	75/25	$n_{Sn} = 7.00$	$n_{Cd} = 2.4$
	67.7/32.2	$n_{Sn} = 5.8$	$n_{Cd} = 2.8$
	55/45	$n_{Sn} = 4.9$	$n_{Cd} = 4.1$
	40/60	$n_{Sn} = 3.4$	$n_{Cd} = 4.5$
Cd	pure	"	$n_{Cd} = 8.3$

There are 3 figures, 3 tables and 6 references, 3 of which are Soviet, 1 Japanese, 1 English and 1 international.

Card 2/3

Investigation of the Structures of Liquid Alloys of Cd and Sn SOV/70-4-3-10/32

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: October 21, 1958

Card 3/3

SOV/78-4-10-2/40

5(2)
AUTHORS: Yevseyev, A. M., Pozharskaya, G. V., Nesmeyanov, An. N., Gerasimov, Ya. I.

TITLE: Vapor Pressure of Lithium Fluoride

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 10, pp 2189-2191 (USSR)

ABSTRACT: The determination of the vapor pressure was carried out according to the effusion method in a nickel chamber because this metal does not react with lithium fluoride. The temperature of the chamber was measured with a Pt-PtRh-thermocouple and a potentiometer of the PPTN-1 type and the galvanometer of the M21/4 type. The easily volatile impurities (Li_2CO_3, LiOH) were removed by heating in vacuo up to 700°. The results of the determination are presented in table 1; figure 1 shows the dependence of the vapor pressure of LiF on the temperature in the range of from 926 - 1026.5°K. From this the heat of sublimation for the absolute zero point was found to be 60.64 kcal/mole. The value is in good agreement with the calculation made by the Institut goryuchikh iskopayemykh Akademii nauk SSSR (Institute of Mineral Fuels of the Academy

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of Sciences, USSR), which gave 60.74±0.1 kcal/mole. There are 1 figure, 2 tables, and 3 references, 1 of which is Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: July 20, 1958

SOV/78-4-10-3/40

3(2)

AUTHORS: Khandamirova, N. E., Yevseyev, A. M., Pozharskaya, G. V., Borisov, Ye. A., Nesmeyanov, An. N., Gerasimov, Ya. I.

TITLE: Pressure of Saturated Vapor of Beryllium Fluoride

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 10, pp 2192-2195 (USSR)

ABSTRACT: Beryllium fluoride was produced according to the method of A. V. Novoselova from beryllium sulfate. The vapor pressure was measured by means of effusion in vacuum and determination of the weight lost during the experiment (Method 1) or by analysis of the resultant condensate (Method 2). The effusion chamber in method 1 was made of tantalum (Fig 1) and was heated by a "Mars"-electric furnace with a power of 1200 w, the temperature was checked thermoelectrically by means of the PPTN-1 potentiometer. In method 2 the effusion chamber consisted of molybdenum. The condensate was analyzed with the colorimetric photometer of the FEK-52 type by using the reagent "Berillon-11 IRYaA". Both methods gave values in good agreement which are given in table 1. By means of the values obtained and of the data found by the Institut goryuchikh iskopayemykh

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Pressure of Saturated Vapor of Beryllium Fluoride SOV/78-4-10-3/40

Akademii nauk SSSR (Institute of Combustible Minerals of the Academy of Sciences, USSR) for the thermodynamic potentials of the gaseous and solid beryllium fluoride the heat of sublimation was calculated to be 55.2±0.6 kcal/mole at 0°K, which is also given in table 1. Table 2 compares this value with the data obtained by K. A. Sense et al (Ref 1) and the value computed on the basis of the 3rd law of thermodynamics. There are 2 figures, 2 tables, and 1 reference.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: July 20, 1958

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5(2)

SOV/78-4-10-4/40

AUTHORS: Yevseyev, A. M., Pozharskaya, G. V., Nesmeyanov, An. N., Gerasimov, Ya. I.

TITLE: Vapor Pressure of Aluminum Fluoride

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 10, pp 2196-2197 (USSR)

ABSTRACT: The papers available so far on the problem mentioned in the title (Refs 1-3) are mentioned in brief and the results obtained by W. Olbrich (Ref 2) and I. I. Naryshkin (Ref 3) were denoted as inexact. The determination of the vapor pressure of AlF_3 was carried out in the temperature range of 980-1123°K in a platinum effusion chamber. The device has already been described in a previous paper (Ref 4). The data obtained are given in table 1. From the experimental data and the heat capacities (these were calculated in Institut goryuchikh iskopayemykh Akademii nauk SSSR - Institute of Combustible Minerals of the Academy of Sciences, USSR) a heat of sublimation of 73.46 kcal/mole at 0°K resulted. Table 2 compares the values obtained with the data of references 1-3. There are 1 figure, 2 tables, and 4 references, 2 of which are

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Vapor Pressure of Aluminum Fluoride SOV/78-4-10-4/40

Soviet.

SUBMITTED: July 20, 1958

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YEVSEYEV, A.M.; POZHARSKAYA, O.V.

Determining the heat of vaporization of manganese. Vest.Mosk.un. Ser.mat., mekh., astron., fiz., khim. 14 no.1:165-169 '59. (MIRA 13:8)

1. Kafedra fizicheskoy khimii Moskovskogo universiteta.
(Manganese) (Heat of vaporization)

5(4)

AUTHOR: Yevseyev, A. M. SOV/76-33-1-19/45

TITLE: The "Ordering Effect" in the Theory of Solutions (Effekt uporyadocheniya v teorii rastvorov)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 1, pp 112 - 118 (USSR)

ABSTRACT: In the first approximation a chaotic and a uniform molecular distribution, respectively, of the various components is assumed by the model theory of solutions. In the case under discussion, however, a short range order was assumed on account of the effect of intramolecular forces and thus a different structure of the solution was presupposed. On investigating the thermodynamics of liquid metallic solutions this effect can be seen as "ordering effect" by the complicated function of the activity coefficient of the concentration. A method of determining the "ordering-effect" in liquid metallic systems within the selfconsistent field method was suggested. Papers by Salsburg and Kirkwood (Solsberg and Kirkvud)(Ref 1) and Prigogine (Prigozhin)(Ref 3) are quoted. At a first approximation the dependence of the distribution

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function on the concentration is roughly shown by supposing that the molecule of the first order is situated in the center of the space lattice of a solution corresponding to this molecule. In the course of further statements equations are given which permit a qualitative (and possibly quantitative) reproduction of the thermodynamic functions, in dependence on the concentration, of several liquid metallic systems. Data on the systems Cd-Bi, Cd-Sb, Pb-Bi, Tl-Pb are given and data by Ya. I. Gerasimov and A. V. Nikol'skaya (Ref 7) and Taylor (Teylor) (Ref 8) are used. There are 4 figures, 1 table, and 12 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 21, 1957

SOV/76-33-9-22/37

5(4)

AUTHORS: Voronin, G. F., Yevseyev, A. M.

TITLE: Thermodynamic Properties of Germanium - Zinc Alloys

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 9, pp 2024 - 2029 (USSR)

ABSTRACT: The authors investigated the thermodynamic properties of liquid and solid germanium - zinc alloys at 342 - 466°C by measuring the pressure of saturated zinc vapor. The method applied is based on a method previously described (Ref 1), which made use of an effusion chamber (thin-walled quartz ampul - 0.22 g), a quartz spring balance (Fig 1) and continuous weighing. The chamber was evacuated to 1.10^{-5} torr, temperature maintained within a limit of $\pm$ 1°, and the change in weight read on a cathetometer. Due to the fact that the weighed quantity of Zn and Ge and the sensitivity of the balance are known, the composition of the alloy can be ascertained at any instant according to equation (1). The resultant values of the evaporation heat of pure liquid Zn at 435° (26.9 kcal/mol), of solid Zn at 380° (28.3 kcal/mol), and the melting point of the alloy at different compositions are in good agreement with corresponding

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Thermodynamic Properties of Germanium - Zinc Alloys SOV/76-33-9-22/37

data of publications. The authors further calculated the activity coefficient, the partial heat of mixing, the isobaric mixing potential for Zn (at 435° C), and the corresponding values for Ge (Table). The mutual solubility of Zn and Ge is weak in solid phase, which is explained by the difference in the nature of the interatomic bonds. The penetration of germanium atoms into the zinc lattice leads to strong deformation of the latter and, consequently, to energy absorption. The system exhibits great negative deviation from perfect solutions in the presence of a strongly positive heat of mixing. It is assumed that the effects arising from the destruction of the zinc structure (during the penetration of germanium atoms) also appear in liquid Ge-Zn alloys. However, this problem needs further investigations. There are 5 figures, 1 table, and 9 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova) (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: February 27, 1958

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05823
SOV/76-33-10-21/45

5 (4)
AUTHORS: Voronin, G. F., Yeryseyev, A. M.

TITLE: Thermodynamic Properties of Liquid Lead-tin Alloys

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 10, pp 2245 - 2248 (USSR)

ABSTRACT: There are no data available in publications on the entropy and free energy of formation of lead-tin alloys. The authors therefore investigated the thermodynamic properties of the lead-tin system within the temperature range 730-790 C by the method of pressure measurement of saturated lead vapors. The evaporation rate of the metals out of the solutions was measured with the help of continuous weighing. A quartz ampoule served as effusion chamber which was suspended on a spring balance. The latter was a spiral (of a quartz filament) and had a sensitivity of 35 mm/g at a maximum load of 1 g. The temperature was measured in the device (Fig 1) by means of a platinum-rhodium thermocouple and a PPTV-1 potentiometer. For this purpose, the authors employed a vacuum of $1 \cdot 10^{-4}$ mm Hg. The volatile component in the determinations was lead. The method used for determining the activity of metals in liquid alloys is similar to that devised by Knudsen for vapor pressure measurement. The thermodynamic functions of

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Thermodynamic Properties of Liquid Lead-tin Alloys 05823 SOV/76-33-10-21/45

the lead-tin system (Table) were calculated from the activity of lead, which in turn was calculated according to equation (3) and data on the rate of evaporation out of the alloy (as compared to those of pure lead). The resultant data on the development of the integral mixing heats in dependence on the concentration of the lead-tin alloy (Fig 2) differed from those of direct calorimetric measurements by Kawakami (Ref 1). They are in better agreement with those obtained by Tayler (Ref 3) for solid solutions. This indicates the similarity of molecular interaction in solid and liquid lead-tin alloys. Herefrom it resulted that lead-tin alloys had a microheterogeneous structure as was also assumed by Ye. G. Shvidkovskiy (Ref 6). Calculations by Samson-Himmelstjerna (Ref 4) indicate that the present data on the mixing heats are more reliable than those contained in reference 1. There are 2 figures, 1 table, and 8 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: October 2, 1957

Card 2/2

S/189/60/000/003/002/003
B002/B056 62404

5.4300

AUTHORS: Yevseyev, A. M., Voronin, G. F.

TITLE: The Problem of the Cell-group Theory of Liquids

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 2, khimiya, 1960, No. 3, pp. 22 - 25

TEXT: Within the framework of the cell theory it is, in principle, possible to calculate the correlations between the motions of neighboring particles by uniting several cells into one group and calculating the sum of states. This idea was suggested for the first time in Ref. 1. Thus, it is possible to determine the statistical weight of each group integral in the manner as suggested by one of the authors in Ref. 2. The Hamiltonian of a system of N particles is represented as the summation over the groups of particles: $H(p_1 \cdots p_N, q_1 \cdots q_N) = \sum_{j=1}^{m} H_{sj}(p_i \cdots p_{i+sj-1}, q_i \cdots q_{i+sj-1})$. Here, p_i, q_i are momentum and coordinate of the i-th

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particle, m - the total number of cell groups, s - the number of particles in the cell group. By putting the expression:

$Q_{sj} = \int \exp\left\{-\beta H_{sj}(p_i \cdots p_{i+sj-1}, q_i \cdots q_{i+sj-1})\right\} dp_i \cdots dp_{i+sj-1} \times dq_i \cdots dq_{i+sj-1}$ for the integral over the cell group, the sum of states of the system may be written down in the following form:

$Q_N = \frac{1}{N!} \prod_{j=1}^{m} g_{sj} Q_{sj}$. Here, g_{sj}, the statistical weight of the j-th integral, is equal to the number of possibilities of the distribution of a group of s distinguishable particles over N cells, where not more than one particle corresponds to each cell, i.e., $g_{sj} = \frac{N!}{(N-Sj)!} g_{sj} = \frac{N!}{(N-S)!}$.

In the case of a perfect gas the correlation between the motion of the atoms in the cells vanishes, i.e., $s \to 1$, $m = N$ and $g_{sj} = N$, and

$Q_{sj} = \lambda^{3/2} \frac{V}{N}$, $Q_N = \lambda^{3N/2} \frac{V^N}{N!}$, $\lambda = \frac{2\pi mkT}{h^2}$. Consequently, the correction

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for the "collective entropy" is not introduced into the theory from outside. In the crystal, the motions of all atoms are interrelated. At sufficiently low temperatures, a group of N cells must be studied, i.e., s = N and m = 1. Consequently, $Q_N = \frac{N!}{N!} Q_{sj}$. Furthermore, Q_{sj} may be expressed as the product of the sums of states of 3N harmonic oscillators, which leads to the Debye crystal. The cell-group model is obviously the best means of reproducing A. S. Predvoditelev's conceptions of the two forms of motion of atoms in a liquid (Ref. 3). If the single atoms oscillate round their equilibria in a field of N-1 atoms, it is possible, by means of the cell-group model, to describe the second "crystalline" component of the motion of atoms in a field of N--s atoms. There are 3 references: 2 Soviet and 1 Dutch.

ASSOCIATION: Kafedra fizicheskoy khimii (Chair of Physical Chemistry)

SUBMITTED: October 17, 1959

Card 3/3

S/189/60/000/006/001/004
B130/B229

AUTHORS: Pozharskaya, G. V. and Yevseyev, A. M.

TITLE: Thermodynamic properties of alloys of the manganese-cobalt system

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 2, khimiya, no. 6, 1960, 15-17

TEXT: The properties of manganese-cobalt alloys are analyzed by the Knudsen method for the determination of small pressures of a saturated vapor. The rate of evaporation was determined by a photometric method. Appliances and schedule of operation were described by the authors in Vestn. Mosk. un-ta, ser. mat., mekh., astron., fiz., khimii, no. 1, 165, 1959. Instead of a drum with photographic paper, the measuring device ЭПП-09 (EPP-09) was used, which records the intensity of light transmittance of the metal film. Quantity $\beta\sqrt{T}$, proportional to the vapor pressure, was determined from the equation $I = I_0 e^{-\beta\tau}$. T is the absolute temperature of the experiment, I the intensity of light falling through the small mica plate on which Mn was deposited at the moment τ, and I_0 the light intensity at the moment $\tau = 0$.

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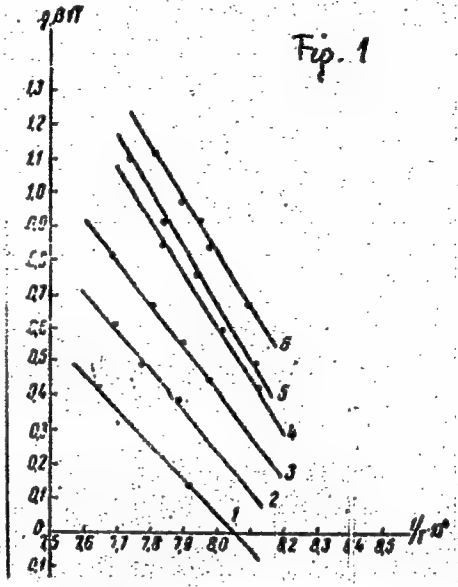
The temperature dependence $\log \beta\sqrt{T_{Mn}}$ for manganese alloys with different proportions of cobalt is shown in Fig. 1. On the strength of the data of Fig. 1, the activity of manganese in the alloys was calculated to be $a = \frac{\beta^{alloy}_{Mn}}{\beta^{0}_{Mn}}$, where β^{alloy}_{Mn} is the quantity proportional to the rate of evaporation of manganese from the alloy, and β^{0}_{Mn} the quantity proportional to the rate of evaporation of pure manganese. The partial heat of formation is characterized by a small negative value at low cobalt concentrations. In the region where the solid solution has a γ-structure (cobalt concentration higher than 0.1 atom parts), a high, positive, partial enthalpy of formation of the alloy is observed, for manganese $\Delta H, \Delta S, \Delta Z$ have been determined by a graphical integration of the Duhem-Margules equation. Their maximum values are shifted from the composition 0.5 atom parts of manganese toward higher manganese concentrations. There are 2 figures, 2 tables, and 4 references: 2 Soviet-bloc.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet, Kafedra fizicheskoy khimii (Moscow State University, Department of Physical Chemistry)

Thermodynamic properties...

SUBMITTED: November 20, 1959

Fig. 1. log $\beta\sqrt{T}$ as a function of temperature. Legend: 1) N_{Mn} = 0.291; 2) N_{Mn} = 0.495; 3) N_{Mn} = 0.625; 4) N_{Mn} = 0.822; 5) N_{Mn} = 0.894; 6) N_{Mn} = 1.00.



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Thermodynamic properties...

N_{Mn}	$\Delta H_{обр}$ ②	$\Delta S^{обр}_{прод}$ ①	$\Delta Z_{обр}$ ③
0,1	3350	3,15	— 625
0,2	6150	5,95	—1359
0,3	8800	8,35	—1738
0,4	10920	10,33	—2117
0,5	12130	11,65	—2572
0,6	12600	12,13	—2708
0,7	11850	11,40	—2537
0,8	9420	9,16	—2165
0,9	3350	3,92	—1597

Table 2. Integral thermodynamic functions of cobalt-manganese alloys ($T = 1262^{\circ}K$). Legend: a) cal; b) cal/deg.

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86495

S/078/60/005/008/031/031/XX
B023/B066

18.1275

AUTHORS: Yevseyev, A. M., Pozharskaya, G. V.

TITLE: Thermodynamic Properties of Alloys of the System Manganese-Vanadium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 8, pp. 1896-1897

TEXT: The thermodynamic properties of alloys of the manganese-vanadium system have so far not been described. The authors studied this problem already in a previous paper (Ref. 1) by means of the Knudsen method. In the present paper, they used the ЭПП-09(EPP-09) apparatus to record the intensity of transparency of the evaporated metal film as a function of time. The activity of manganese was calculated from the ratio

$a_{Mn} = \frac{\beta^{alloy}_{Mn}}{\beta^{o}_{Mn}}$. β^{alloy}_{Mn} is the value proportional to the evaporation rate of manganese from the alloy of a given composition; β^{o}_{Mn} is the value proportional to the evaporation rate of pure manganese. Table 1 presents

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Thermodynamic Properties of Alloys of the System Manganese-Vanadium

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B023/B066

data on the activity of manganese in the alloys Mn-V at 1316°, 1250°, and 1235°K. A figure on p. 1897 shows a phase diagram in the temperature range 930-1100°C. α-, β-, and γ-phases are solid solutions; σ is the phase whose appearance is connected with the formation of an intermetallic compound with 0.5 Mn atoms. To the right and to the left of the σ-phase there are $\alpha+\beta$ and $\gamma+\sigma$-mixtures. Various publications confirm the hypothesis on the heterogeneity of the $\alpha+\beta$ range and of the compound MnV. Table 2 gives data on the partial and integral heats of formation and entropies of formation of the above alloys at 1283°K. The bend of the curve at a 1 : 1 concentration corresponds to the heat of formation of the compound MnV. The maximum heat of formation is found with a concentration ≈ 0.33 Mn atoms. The formation enthalpy and the excess formation entropy of the alloys are positive. This is indicative of a considerable weakening of the cohesive power between the atoms in the formation of alloys, as well as of a considerable increase of the dynamic distortion of the alloy lattice. There are 1 figure, 2 tables, and 2 references: 1 Soviet and 1 US.

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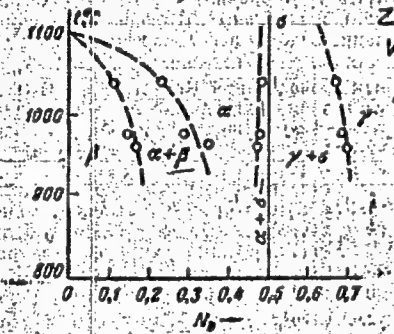
86495
S/078/60/005/008/031/031/XX
B023/B066

Thermodynamic Properties of Alloys of the System Manganese-Vanadium

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: January 14, 1960

Legend to the figure: Section of the phase diagram of the Mn - V system.



Участок диаграммы состояния системы Mn — V

ZNC 1960, Vol. 5, No 8 pp. 1896-97

Card 3/3

S/074/60/029/05/04/005
B003/B006

5.2610

AUTHOR: Yevseyev, A. M.

TITLE: Thermodynamics and Structure of Metal Alloys

PERIODICAL: Uspekhi khimii, 1960, Vol. 29, No. 5, pp. 669-685

TEXT: This survey gives a correlation between the structure and thermodynamic properties of alloys. The following subjects are treated: thermodynamics of liquid alloys having a eutectic in the solid state (Refs. 1-22) - Figs. 1-7, Table 1, liquid alloys of systems forming compounds in the solid state (Refs. 4, 5, 13, 15, 23-31) - Figs. 8 and 9, solid solutions in which orientation occurs (Refs. 32-47) - Figs. 10-13, Tables 2-4. Structure in the sense used here is mainly limited to the short-range order of atoms in liquid and solid alloys. This was done in consideration of the importance of the short-range order in liquid alloys for the clarification of crystallization questions and, in solid alloys, for the observation of solidification phenomena in solid solutions. It is known that the disperse hardening of alloys is connected with their sub-microheterogeneity. The interactions between the defects and accumulations of atoms are assumed to be one of the causes of solidification. From the standpoint of the statistical theory, the short-

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range order is important for determining thermodynamic properties of alloys. Presumably, short-range order occurs in the majority of alloys. It affects not only the thermodynamic properties of alloys, but also their physical properties. It was found that orientation phenomena can generally be divided into two types, i.e. "formation of layers" and "compound formation". This holds for both liquid- and solid solutions. There is a direct relation between short-range order in liquid solutions and structure in the solid state. This confirms the hypothesis by V. I. Danilov and I. V. Radchenko on the correlation between the structures of liquid and solid alloys. A combined analysis of thermodynamic- and structural data of liquid alloys renders it possible to verify the correctness of the statistical cell theory. The fundamentals of this theory were first published by Ya. I. Frenkel' (Ref. 48). According to this theory, the atoms in the liquid are mostly in a state of vibrational movement within cells formed by other atoms, in similarity to the movement of atoms in a solid. By introducing the concept of two types of cells (Ref. 11), it is possible to define the cellular model of a liquid more closely, and to correlate thermodynamic- and

structural data. Alloys with a eutectic form quasi-eutectic liquid solutions. Atomic packings similar to the short-range order of an intermetallic compound are formed in the liquid by alloys with intermetallic compounds. "True" solutions with a disorientated distribution of different atoms occur less frequently and only at sufficiently high temperatures. Atomic orientation is also visible in solid solutions. The thermodynamic functions of these and liquid alloys are, strangely, dependent on concentration. This proves their dependence on the short-range order of atoms, for the neighboring atoms are presumably very important in this respect. However, it should be added that the short-range order comprises not only the neighboring atoms in the first coordinate sphere but also the following atoms in the second and in the third coordinate spheres. The part played by these atoms in the interaction has not yet been exactly determined. Finally, the author points out that it is impossible to establish the relationship between the structure and the thermodynamic properties of the above-mentioned alloys without taking account of the long-range order. A. F. Skryshevskiy, A. I. Bublik, A. G. Buntar', A. S. Lashko, K. Vagner, B. R. T. Forst, and U. L. Bregg are also mentioned in the article under review. There are 13 figures, 4 tables, and 48 references, 20 of which are Soviet.

Card 3/4

Thermodynamics and Structure of Metal Alloys S/074/60/029/05/04/005
B008/B006

ASSOCIATION: Khimicheskiy fakul'tet MGU im. M. V. Lomonosova
(Chemical Department of MSU (Moscow State University)
imeni M. V. Lomonosov)

Card 4/4

S/076/60/034/04/19/042
B010/B009

AUTHORS: Otopkov, P. P., Yevseyev, A. M. (Moscow)

TITLE: Formation Heat and Physical Properties of Intermetallic Semiconductor Compounds

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 4, pp. 815 - 818

TEXT: With regard to the width of the forbidden band ΔE_0 of semiconductors only one rule exists, according to which ΔE_0 decreases in a number of semiconductors as the atomic weight of the variable component increases. Some references in connection with the change of ΔE_0 have also been made by B. F. Ormont (Ref. 4) and N. A. Goryunova (Refs. 5,6). To find a more distinct dependence of ΔE_0 upon the properties of a solid the authors in the present case start from the assumption made by A. F. Ioffe (Ref. 7) as well as the fact that the properties of the semiconductor must depend on the nature of the forces acting between the atoms. Since a connection between the atomizing energy and ΔE_0 is apparent, values for ΔE_0 of intermetallic semiconductors found in various publications were compared to calculated values of the atomic formation energy of these compounds found in papers by Cottrell (Ref. 8) and Kubaschevski (Ref. 10). An empirical dependence of ΔE_0

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Formation Heat and Physical Properties of Intermetallic Semiconductor Compounds

S/076/60/034/04/19/042
B010/B009

upon the atomizing energy was found to exist. At the same time, an optimum curve was observed. On the basis of this rule the ΔE_0 of Ca_3Sb_2 was found by the determination of the absorption coefficient with the aid of an ISP-51 spectrograph and the dependence observed was confirmed to exist. Thus the energetic characteristics of semiconductors depend in the first place on the arrangement of atoms and are closely related to the type of chemical bond, which may be characterized by the atomizing energy. There are 4 figures and 10 references, 8 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 30, 1958

Card 2/2

S/076/60/034/05/38/038
B010/B003

AUTHOR: Yevseyev, A. M.

TITLE: Calculations of the Sum of Rotational States of Molecules in a Liquid

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 5, pp. 1140-1149

TEXT: In the case of complicated molecules (with rotational degrees of freedom) the asymmetry of the field can be considered by means of the selfadjusted field of force (Ref. 1) if the field of other molecules acting upon this field is assumed to be isotropic. Thus, the calculation of the statistical sum of states is simplified. It must be taken into consideration, however, that the rotation of molecules in the liquid is not free but inhibited like the intramolecular rotation according to the author's hypothesis (Ref. 2). The calculation given here is based on the Schroedinger equation; the energy of the system of interacting molecules is subdivided into four parts so that the equation for H_j can be

Card 1/2

Calculations of the Sum of Rotational States of Molecules in a Liquid

S/076/60/034/05/38/038
B010/B003

represented by 4 sums. The statistical sum Z is obtained from the said equation. There are 2 Soviet references.

SUBMITTED: November 4, 1958

Card 2/2

83694

S/076/60/034/008/008/014
B015/B054

5.4700

AUTHORS: Piloyan, G. O., Yevseyev, A. M. and Gerasimov, Ya. I. (Moscow)

TITLE: Thermodynamic Properties of Alloys of the System Chromium - Tantalum

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 8, pp. 1768-1772

TEXT: The authors determined the thermodynamic properties of chromium-tantalum alloys by measuring the pressure of chromium vapor with the use of the Knudsen effusion method. The measurements were made on eight samples at temperatures between 1228.5° and 1303.5°C; for calculating the activity of chromium, the authors measured vapor pressures at 1501.5° and 1576.5°K (Table 1), and therefrom determined the activity of chromium in the chromium-tantalum system (Table 2). They determined the integral formation heats and entropies of chromium-tantalum alloys by graphic integration from the Duhem-Margules equation (Table 3). The

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83694

Thermodynamic Properties of Alloys of the System Chromium - Tantalum

S/076/60/034/008/008/014
B015/B054

results obtained suggest the presence of a solid solution up to 7 atom% of Cr on the chromium side, and of a heterogeneous region and a solid solution on the basis of $TaCr_2$. On the tantalum side there is apparently a solid solution of chromium in tantalum up to 30 atom% of chromium. The maximum partial formation heat corresponds to the composition of the stoichiometric interphase $TaCr_2$. O. Kubashevskiy, G. B. Bokiy, and E. Ye. Vaynshteyn are mentioned in the paper. There are 3 figures, 3 tables, and 8 references: 3 Soviet and 5 US.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: November 15, 1958

Card 2/2

S/076/60/034/011/007/024
B004/B064

AUTHORS: Alekseyev, N. V. and Yevseyev, A. M. (Moscow)

TITLE: Investigation of the Thermodynamic Properties of the System Cd - Sn

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 11, pp. 2460 - 2462

TEXT: The authors investigated the thermodynamic properties of the system Cd - Sn in the temperature range 567° - 600°K by a modified effusion method. This method allowed the composition to be determined at any time. This was done by the use of a continuous balance. Each experiment was carried out at a constant temperature (567°, 589°, 600°K) until the volatile component was completely evaporated. It was therefore possible to measure the rate of evaporation of the volatile component for the entire range of concentration. Table 2 lists the values obtained, which differ only slightly from those of Refs. 2-6. A little deviation from the properties of a normal solution occurs at small Cd concentrations. There are 1 figure, 2 tables, and 6 references: 1 Soviet, 1 US, 1 British, and 3 German.

Card 1/2

Investigation of the Thermodynamic Properties of the System Cd - Sn

S/076/60/034/011/007/024
B004/B064

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: February 8, 1959

N_{Cd}	$\overline{\Delta H}_{Cd}$ kal/g-am 1)	ΔH, kal/g-am 1)	$\overline{\Delta S}_{Cd}$ kal/grad, g-am 2)	ΔS, kal/grad, g-am 2)
0,0	1450	0,0	6,72	0,0
0,1	1345	218	5,45	0,90
0,2	1057	327	4,15	1,32
0,3	810	395	2,85	1,59
0,4	625	455	1,95	1,76
0,5	468	468	1,62	1,72
0,6	295	447	1,23	1,68
0,7	137	386	0,85	1,57
0,8	60	290	0,47	1,28
0,9	30	184	0,18	0,77
1,0	0,0	0,0	0,0	0,0

Legend to Table 2: 1) cal/g-atom 2): cal/degree.g-atom

Card 2/2

YEVSEYEV, A.M.; VORONIN, G.F.

Cellular-group theory of solutions. Zhur. fiz. khim. 34 no. 11:2579-2582 N '60. (MIRA 14:1)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
(Solution (Chemistry))

AUTHOR: Yevmeyev, A. M.

S/020/60/131/04/020/073
B013/B007

TITLE: Radial Distribution of Atoms in a Liquid

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 4, pp 789-792 (USSR)

TEXT: It is suggested in the present paper that the superposition approximation used for the computation of $\varrho(r)$ be replaced by the following premise: For a liquid, one can introduce the system of particle coordinates $\vec{r}_o = \left[\vec{r}_1^{\,o}, \vec{r}_2^{\,o}, \ldots, \vec{r}_N^{\,o}\right]$ in such a manner that $U(\vec{r}_1^{\,o}, r_2^o, \ldots, r_N^o) = \min$ holds. In fact, in the case of low densities N/V, the probability of the configuration of two atoms can be calculated by N. N. Bogolyubov's method of correlative functions: $dw(\vec{r}_1, \vec{r}_2) = \varrho(\vec{r}_1, \vec{r}_2) \frac{d\vec{r}_1 d\vec{r}_2}{V^2}$. In this case, $\varrho(\vec{r}_1, \vec{r}_2) = \varrho(r)$ is calculated for an isotropic medium. The author then introduces the concept of the conditional probability of realization of the configuration of two particles in the position $\vec{r}_1, \vec{r}_2$, if the respective equilibrium centers are situated in the points $\vec{r}_1^{\,o}$, $\vec{r}_2^{\,o}$:

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Radial Distribution of Atoms in a Liquid

S/020/60/131/04/020/073
B013/B007

$$P(\vec{r}_1, \vec{r}_2 | \vec{r}_1^{\,0}, \vec{r}_2^{\,0}) = \frac{d\vec{\eta}_1 d\vec{\eta}_2 \int_{\omega_3} \cdots \int_{\omega_N} \exp(-U(r)/kT) d\vec{\eta}_3 \cdots d\vec{\eta}_N}{\int_{\omega_1} \int_{\omega_2} \cdots \int_{\omega_N} \exp(-U(r)/kT) d\vec{\eta}_1 \cdots d\vec{\eta}_N}$$

. For an isotropic medium (a liquid), the preceding conditional probability can be averaged over the directions, and one obtains the probability of finding two arbitrarily chosen particles at the distance r from each other (regardless of direction): $P(r/r^0) = k(r/r^0)dr = \int_{\omega_1} \int_{\omega_2} P(\vec{\eta}_1, \vec{\eta}_2) d\vec{\eta}_1 d\vec{\eta}_2 \cdot \delta(|\vec{r}_{12}| - r)$. Here, $r = |\vec{r}_1 - \vec{r}_2|$, $\vec{r}_{12} = \vec{r}_1^{\,0} - \vec{r}_2^{\,0} - \vec{\eta}_1 + \vec{\eta}_2$ holds, where δ denotes the Dirac function, and $k(r/r^0)$ is the conditional density of the probability distribution. From the formula for the total probability, the author then obtains the probability distribution density for the case in which two arbitrary particles are located at the distance r from each other, if the probability distribution density is given to the position of the equilibrium centers. The exact computation of $k(r/r^0)$ is dependent on the possibility of neglecting the

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interlinkage between the particles. In the limiting case, the condition $\partial^2 U/\partial\eta_i\partial\eta_j = 0$ denotes the independence of the motion of particles in the cells with every $i \neq j$. The problem is solved in first approximation for the model of rigid spheres: $\Phi(r) = +\infty$, $r \leqslant d_0$; $\Phi(r) = 0$, $r > d_0$, where d_0 denotes the diameter of the sphere. In this case, $k(r - r^0) = \frac{1}{\omega^2}\int S_2(t,h_1)S_1(h_1)dh_1$ holds. Here, $S_1(h_1)dh_1$ denotes an element of volume of the first cell, $S_2(t,h_1)dr$ an element of volume of the second cell with given $t = r - r^0$. After a few intermediate calculations one obtains

$$x^2\{\varrho(x)-1\} = \varepsilon\int_{x-2}^{x+2} k(x-s)\cdot\frac{(s^2 - \alpha)}{s^2}\{\Phi(s) - 1\}\, s^2 ds .$$

With $s \to \infty$, $\Phi(s) \to 1$ holds. $\Phi(s)$ has the same properties as $\varrho(x)$ not only at infinity, but also when $a < x < \infty$. By neglecting the small quantity α, one obtains the integral

Radial Distribution of Atoms in a Liquid

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equation $\varphi(x) = \varepsilon \int_{x-2}^{x+2} k(x-s)\varphi(s)ds$, $x > a$. After some more operations one obtains the final solution in the form of $\varphi(x) = x^2\{\varrho(x) - 1\} = \sum_n A_n e^{\alpha_n x} \cos(\beta_n x + \delta_n)$, where $\alpha_n \pm i\beta_n = z_n$, viz. the n-th pole of a function given in the present paper. Figure 2 shows the function $\varrho(r)$ calculated for the special cases $d_o = 3$ A, $\varepsilon_1 = 0.20$ A, and $\varepsilon_2 = 0.15$ A. This function $\varrho(r)$ gives a general description of the radial distribution function determined experimentally. There are 2 figures and 4 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED: December 4, 1959, by N. N. Bogolyubov, Academician

SUBMITTED: November 25, 1959

Card 4/4

ALEKSEYEV, N.V.; GERASIMOV, Ya.I.; YEVSEYEV, A.M.

Thermodynamic properties of liquid indium-bismuth alloys. Dokl. AN SSSR 134 no.3:618-620 S '60. (MIRA 13:9)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
2. Chlen-korrespondent AN SSSR (for Gerasimov).
(Indium-bismuth alloys)

S/189/61/000/006/003/005
D228/D304

AUTHORS: Yevseyev, A.M., Pozharskaya, G.V. and Zenkevich, L.V.

TITLE: Thermodynamic properties of alloys of cadmium with lead

PERIODICAL: Moscow. Universitet. Vestnik. Seriya II, khimiya, no. 6, 1961, 28-30

TEXT: Previous data on the thermodynamic properties of Cd-Pb alloys are based on e.m.f. measurements at 773°K. The authors, however, determined the pressure of saturated vapors in the temperature range 603 - 643°K by the method of G.F. Voronin and A.M. Yevseyev (Ref. 2: Zh. fiz. khimii, 33, no. 10, 1959). This entails the measurement of the rate of Cd vaporization and certain calculations: a) The activity of Cd from

$$a_{Cd} = \frac{V_x \sqrt{T}}{V_0 \sqrt{T}}$$

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where v_x and v_o are the rates of vaporization for Cd in an alloy of a given composition and for pure Cd respectively; b) the partial heat of combination from

$$\bar{\Delta}H_{Cd} = 4{,}575 \cdot \frac{\Delta \lg f_{Cd}}{\Delta 1/T}$$

where f_{cd} is the coefficient of activity for Cd in Pb alloys; and c) the partial entropy of combination from

$$\Delta S_{Cd} = -4{,}575 \cdot \frac{\Delta(T \lg f_{Cd}}{\Delta T}$$

The corresponding integral values

$$\Delta H_{s\,m} = N_{PB} \int_{c}^{N_{Cd}} \bar{\Delta}H_{Cd}\, d \cdot \frac{N_{Cd}}{N_{PB}}, \quad \Delta S_{s\,m} = N_{PB} \int_{0}^{N_{Cd}} \bar{\Delta}S_{Cd}\, d \cdot \frac{N_{Cd}}{N_{PB}}.$$

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were then found by the graphic integration of the Diugem-Margules equations. Comparison of the curves of the relationship of the partial heats of formation for Cd to the concentration of Cd, and also of the integral heats of formation for alloys at different temperatures, shows that the course of the curves changes as the temperature falls. In particular, considerable deviation was noted between the curve of $H = f(x)$ and the one for data calculated from e.m.f. measurements at 773°K. This variation of the character of the relationship of the thermodynamic functions for an alloy to the concentration is believed to be connected with the change in the alloy's structure - as would, in fact, be expected from the probable atomic grouping at such a temperature. There are 1 figure, 1 table and 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: J.F. Elliott, J. Chipman, Trans. Faraday Soc. 47, 138 (1951).

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Thermodynamic properties ... S/189/61/000/006/003/005
D228/D304

ASSOCIATION: Kafedra fizicheskoy khimii (Department of Physical Chemistry)

SUBMITTED: June 13, 1960

Card 4/4

YEVSEYEV, A.M.

Calculation of the partition function by the cell method. Zhur. fiz. khim. 35 no.1:94-97 Ja '61. (MIRA 14:2)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
(Statistical mechanics)

18-1240

25719
S/020/61/139/003/018/025
B103/B208

AUTHORS: Otopkov, P. P., Gerasimov, Ya. I., Corresponding Member AS USSR, and Yevseyev, A. M.

TITLE: Study of thermodynamic properties of cerium-lead, praseodymium-lead, and neodymium-lead alloys

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 3, 1961, 616-617

TEXT: The authors determined the activity of lead in its alloys with cerium, praseodymium, and neodymium. They applied the method of measuring the pressure of the saturated vapor. They studied alloys with lead concentrations that corresponded to heterogeneous ranges: from 0.97 to 0.75, from 0.75 to 0.50, from 0.50 to 0.33, and from 0.33 to ~ 0.005 atomic portions of lead. 3-4 alloys were examined in each range. The authors note that the phase diagrams for the systems Ce—Pb and Pr—Pb have so far not been determined with sufficient precision, while the diagram for the system Nd—Pb is not available at all (Ref. 1: M. Hansen, K. Anderko, Constitution of Binary Alloys, N. Y., 1958). The authors assume that all three diagrams belong to the same type as the phase

Card 1/

Study of thermodynamic properties...

diagram for the system La—Pb in which the following compounds were detected: $LaPb_3$, LaPb, and La_2Pb. Device and methods used had been earlier described (Ref. 2: G. F. Voronin, A. M. Yevseyev, ZhFKh, 33, 2245 (1959)). The alloys were produced from 99.9 % pure rare earths and from spectrally pure lead. The method used permits a determination of the activity a_i of one of the alloy components and the variation of the chemical potential during the formation of the alloy according to the formula: $\Delta\mu_i = RT \ln a_i$. The evaporation rate of lead from the alloys (which is proportional to the vapor pressure) was measured between 700 and 900°C; a_i for lead was calculated for 720-800°C (Table 1). According to known formulas the authors further determined the partial enthalpies and entropies of alloy formation, and the integral enthalpies and entropies of the alloy formation by graphical integration of the Dyugem-Margules equation. The latter enthalpies of all three systems were found to be only slightly different. It is concluded therefrom that the interactions of the three rare earths studied with lead belong to the same type. The negative sign of the entropies of alloy formation is related to the sign of the formation enthalpies, i.e., to a strengthening of interatomic bonds

Card 2/4

Study of thermodynamic properties...

in the alloys. The error in the determination of a_i of lead was 1 %, that in the calculation of the enthalpy of alloy formation, 20 %, and of the entropy, 25 %. The authors' opinion is that their results confirmed the existence of 3 intermetallic compounds in the system Nd—Pb, of one compound CePb, and of a heterogeneous range which correspond with the phase diagram in the system La—Pb. There are 1 figure, 3 tables, and 2 references: 1 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication is given in the body of the abstract.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: March 20, 1961

30034
S/020/61/141/001/019/021
B119/B108

5.4800 also 1555

AUTHORS: Otopkov, P. P., Gerasimov, Ya. I., Corresponding Member AS USSR, and Yevseyev, A. M.

TITLE: Examination of the thermodynamical properties of platinum-lead alloys

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 1, 1961, 154-156

TEXT: The authors determined the activity of Pb in Pt-Pb alloys of different compositions by measuring the Pb vapor pressure (Knudsen's effusion method). Method and equipment are described in a previous paper (G. F. Voronin, A. M. Yevseyev, ZhFKh, 33, 2245 (1959)). The object of this work was to compute ΔH and ΔS of these alloys. The atomic concentration N_{Pb} of Pb in the alloys was varied from 0.921 to 0.113. The evaporation rate of Pb which was proportional to vapor pressure, was measured in the temperature range of 700-875°C. From the data obtained the activities of Pb were computed in the temperature range of 700-790°C. At N = 0.921, the activity a_i of Pb is 0.891 both at 700 and 790°C. At N_{Pb} = 0.113,

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Examination of the thermodynamical ...

a_i is 0.006 at 700°C, and 0.016 at 790°C. In addition, the partial formation enthalpies and entropies of the alloys in question were determined, and the integrals of these quantities were found by graphical integration. The error limit is ~1% in the determination of the activity of Pb, ~20% in the determination of the enthalpy, and ~25% in the determination of the entropy. The thermodynamic functions for the Pb-Pt systems in question are listed in Table 2. There are 2 figures, 2 tables, and 2 references: 1 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: M. Hansen, K. Anderko, Constitution of Binary Alloys, no. 4, 1958.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 21, 1961

Card 2/2

YEVSEYEV, A.M.

STRUCTURE AND PHYSICAL PROPERTIES OF MATTER IN A LIQUID STATE
reports read at the 4th Conference convened in KIYEV from 1 to 5 June 1959, published by the publishein House of KIYEV University, KIYEV, USSR, 1962

YEVSEYEV, A.M.

STRUCTURE AND PHYSICAL PROPERTIES OF MATTER IN A LIQUID STATE reports read at the 4th Conference convened in KIYEV from 1 to 5 June 1959, published by the publishein House of KIYEV University, KIYEV, USSR, 1962

A1

S/843/62/000/000/009/010
D207/D308

AUTHORS: Gerasimov, Ya.I., Nikol'skaya, A.V. and Yevseyev, A.K.

TITLE: Thermodynamic properties of liquid metal alloys

SOURCE: Stroyeniye i fizicheskiye svoystva veshchestva v zhidkom sostoyanii; materialy IV soveshch. po probl. zhidkogo sost. veshchestva, v Kiyeve 1959 g. Kiev, Izd-vo Kiev. univ., 1962, 115-118

TEXT: Knowledge of the thermodynamic properties of metal solutions is very valuable in the general theory of solutions. The present paper reports a study of the thermodynamic properties of the liquid alloys of copper with cadmium, antimony or bismuth, of bismuth with cadmium, and of lead with tin. The copper and bismuth alloys were investigated by the emf method, the lead-tin alloys were studied using the pressure of lead vapor measured by the effusion method. The work was carried out at 400-900°C. The experimental results were used to calculate the activity coefficients of the com-

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ponents, the enthalpy, and the change of the entropy of mixing, all as a function of temperature and composition. Brief discussions of the results of each of the alloy systems are followed by the general conclusion that the thermodynamic properties can be used to obtain qualitative information on the atomic structure of the alloys using the relationship between the composition dependences of the thermodynamic functions in solid and liquid states. Eutectic liquid alloy systems had microinhomogeneous structure, i.e. they had a short-range order of 'layered' type. In other alloys the short-range order varied continuously with composition and the presence of microinhomogeneities was less noticeable. There are 5 figures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

37803

S/120/62/000/002/033/047
E194/E435

18.8400

AUTHORS: Voronin, G.F., Yevseyev, A.M., Alekhin, S.P.

TITLE: Determination of the molecular composition distribution of the vapours of metals and alloys

PERIODICAL: Pribory i tekhnika eksperimenta, no.2, 1962, 141-142

TEXT: In analysing the properties of condensing phases, knowledge is required about the molecular composition of vapour above the surface of a solid or liquid substance, compound or solution. This article describes a device which analyses the velocity of molecules evaporated in a chamber. The chamber is located below two coaxial rotating discs the lower of which, made of dural, carries four radial slots ranging in width from 0.3 to 2.4°. The vaporized material is deposited on the upper disc of polished transparent plastic, the deposit density distribution depends on the molecular velocity in the vapour. The vapour composition and the vaporization factors of fractions of different molecular composition may be calculated from the velocity distribution by a formula similar to that of O.Stern (Ref.2: Z. Phys., v.41, 1927, 563). The discs are 180 mm diameter

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Determination of the molecular ...

and the distance between tham may range from 70 to 180 mm; they are driven at speeds up to 15000 rpm, the speed being measured by comparing the frequency of signals picked up from a photo cell illuminated through the slots against a standard audio-frequency generator. The substance contained in a cylindrical tantalum crucible is vaporized in a small electric furnace with molybdenum heaters and the molecular beam passes through the lower disc and two collimator slots before reaching the upper disc. The density of deposit on the upper disc is measured by a photo cell photometer. The equipment is evacuated to a vacuum of 5×10^{-6} to 1×10^{-5} mm Hg by a vacuum pump and two diffusion pumps. The test procedure is described, a reference deposit is first produced with the discs rotating very slowly, and then vaporization is carried out with the discs running at the required speeds until a visible trace has been obtained from each of the four slots. The narrower slots give the more accurate results but the wider afford the possibility of discovering the presence in the vapour of molecular fractions of low concentration. Results are quoted of an eight-hour test

S/120/62/000/002/033/047
E194/E435

Determination of the molecular ...

on antimony. There are 2 figures.

ASSOCIATION: Khimicheskiy fakul'tet MGU
(Chemistry Division MGU)

SUBMITTED: July 29, 1961

Card 3/3

POZHARSKAYA, G.V.; YEVSEYEV, A.M.

Investigation of the thermodynamic properties of cadmium-indium alloys. Zhur.fiz.khim. 36 no.5:1053-1054 My '62. (MIRA 15:8)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Cadmium-indium alloys)

VORONIN, G.F.; YEVSEYEV, A.M.

Composition of equilibrium antimony vapor. Zhur.fiz.khim. 37 no.7: 1616-1619 Jl '63. (MIRA 17:2)

1. Moskovskiy gosudaratvennyy universitet.

YEVSEYEV, A.M.

Conditional distribution functions in the theory of liquids. Zhur.fiz. khim. 37 no.10:2310-2314 O '63. (MIRA 17:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

YEVSEYEV, A.M.

Self-diffusion in liquids. Zhur. fiz. khim. 38 no.1:220-223 Ja'64. (MIRA 17:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

POZHARSKAYA, G.V.; YEVSEYEV, A.M.

Thermodynamic properties of alloys of the system manganese-nickel. Zhur. fiz. khim. 36 no.6:1358-1360 Je '62. (MIRA 17:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

YEVSEYEVA, G.V.; YEVSEYEV, A.M.; ZENKEVICH, L.V.

Thermodynamic properties of alloys of the system cadmium - thallium. Zhur. fiz. khim. 38 no.3:801-802 Mr '64.

(MIRA 17:7)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

VORONIN, G.F.; YEVSEYEV, A.M.

Determination of the thermodynamic properties and molecular composition of the vapor of binary alloys by the effusion method. Part 2. Zhur.fiz.khim. 38 no.11:2694-2697 N '64.

(MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

YEVSEYEV, A.M.

Conventional distribution functions and the structure of liquids. Zhur.fiz.khim. 38 no.11:2706-2710 N '64. (MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova, khimicheskiy fakul'tet.

VORONIN, G.F.; YEVSEYEV, A.M. (Moscow)

Determination of the thermodynamic properties and molecular composition of the vapor of binary alloys by the effusion method. Part 2: Differential method of analyzing the results of measurements in systems with wide homogeneity regions. Zhur. fiz. khim. 38 no.12:2857-2861 D '64.

(MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

VORONIN, G.F.; YEVSEYEV, A.M.

Determination of the thermodynamic properties and molecular composition of alloy vapors by the effusion method. Part 3. Zhur.fiz.khim. 39 no.11:2760-2762 N '65.

(MIRA 18:12)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.

VORONIN, G.F.; YEVSEYEV, A.M.

Free vaporization of antimony from its alloys. Zhur. fiz. khim. 39 no. 1:172-173 Ja '65 (MIRA 19:1)

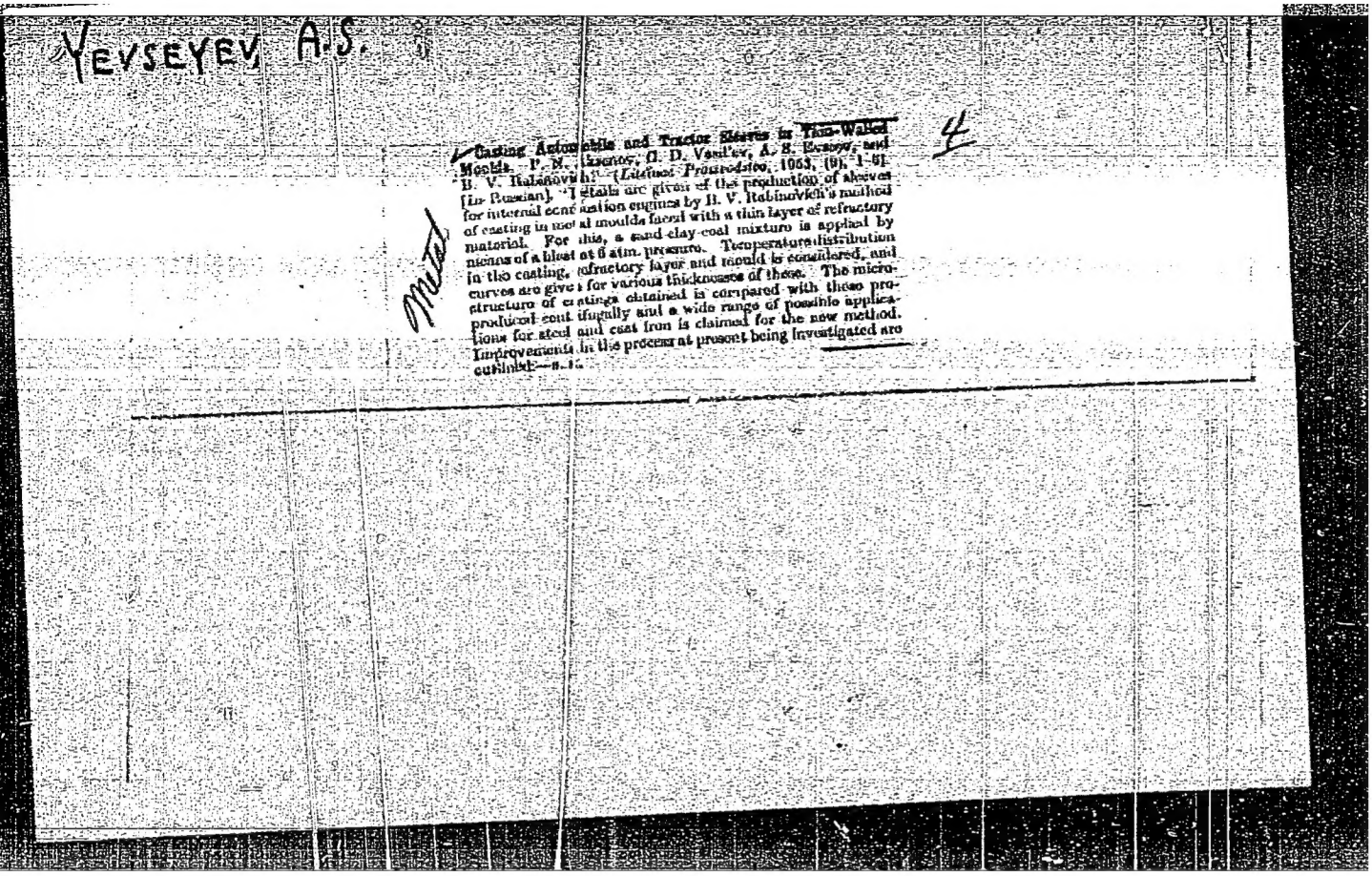
1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova. Submitted December 11, 1963.

SMOLYAK, V.A., kand.tekhn.nauk; YASHIN, Yu.F., inzh.; UZLIUK, V.N., inzh.; Prinimali uchastiye: BALYUH, F.B.; KONOVALOV, M.S.; SEL'DYAKOV, M.I.; TREGUB, N.G.; POLOVCHENKO, Yu.I.; KHODOROVSKIY, S.S.; CHERNYY, A.A.; YEVSEYEV, A.N.; KOVALENKO, I.A.

Radiometric investigation of blast furnace tuyere zones. Stal' 21 no.9:777-782 S '61. (MIRA 14:9)

1. Dneprodzerzhinskiy metallurgicheskiy zavod-vtuz i Zavod im. Dzerzhinskogo.

(Blast furnaces)



YEVSEYEV A.S.

4

Casting Automobile and Tractor Sleeves in Thin-Walled Moulds. P. M. Ivanov, G. D. Vasil'ev, A. S. Evseyev, and B. V. Rabinovich. (Liteinoe Proizvodstvo, 1953, (9), 1-5) (In Russian). Details are given of the production of sleeves for internal combustion engines by B. V. Rabinovich's method of casting in metal moulds lined with a thin layer of refractory material. For this, a sand-clay-coal mixture is applied by means of a blast at 6 atm. pressure. Temperature distribution in the coating, refractory layer and mould is considered, and curves are given for various thicknesses of these. The microstructure of castings obtained is compared with those produced conventionally and a wide range of possible applications for steel and cast iron is claimed for the new method. Improvements in the process at present being investigated are outlined.—S.I.

Metal